WHAT IS CLAIMED IS:

1.    (New)  A method for calibrating an electronic compass, comprising:

receiving data from a magnetic field sensor;

calculating a first averaged data points based on the data received from the magnetic field sensor;

calculating a second averaged data points based on the data received from the magnetic field sensor;

determining new deviation compensation data based on the first averaged data point and based on the second averaged data point; and

calculating new time-weighted deviation compensation data based on the new deviation compensation data and a plurality of old deviation compensation data, wherein the new deviation compensation data is more heavily weighted than any of the plurality of old deviation compensation data.

2.    (New)  The method of claim 1, further comprising displaying a heading based on data received from the magnetic field sensor which has been compensated based on the new time-weighted deviation compensation data.

3.    (New)  The method of claim 1, wherein;

the plurality of old deviation compensation data are represented by an old time-weighted deviation compensation data; and

calculating the new time-weighted deviation compensation data comprises averaging the new deviation compensation data and the old time-weighted deviation compensation data, whereby the new time-weighted deviation compensation data comprises an equal amount of a value of the new deviation compensation data as the old time-weighted deviation compensation data.

4.    (New)  The method of claim 3, wherein a processing circuit is used to

calculate the at least two averaged data points, determine the new offset, and calculate the new time-weighted offset.

5.    (New)  The method of claim 1, wherein a first averaged data point of the at least two averaged data points is calculated based on data obtained while a vehicle is being driven continuously in about a same direction.

6.    (New)  The method of claim 1, further comprising;

determining whether the new deviation compensation data is within a tolerance of old deviation compensation data; and

using particular deviation compensation data to calculate the new time-weighted deviation compensation data based on whether the new deviation compensation data is within a tolerance of an old time-weighted deviation compensation data.

7.    (New)  The method of claim 6, wherein the new deviation compensation data is averaged with the plurality of old deviation compensation data if it is determined that the new deviation compensation data is not within the tolerance of the old time-weighted deviation compensation data, but that the new deviation compensation data is a first consecutive time that a new deviation compensation data has not been within the tolerance of the old time-weighted deviation compensation data.

8.    (New)  The method of claim 6, wherein the new deviation compensation data is used as the new time-weighted deviation compensation data if the new deviation compensation data is not within the tolerance of the old time-weighted deviation compensation data.

9.    (New)  The method of claim 8, wherein the new deviation compensation data is used as the new time-weighted deviation compensation data only if a predetermined criteria is met. .

10.    (New)  The method of claim 9, wherein the predetermined criteria is selected from a group consisting of;

the new deviation compensation data not being within one radius length of the old time-weighted deviation compensation data, and

the new deviation compensation data is not a first consecutive new deviation compensation data to not be within a predetermined tolerance of an old time-weighted deviation compensation data.

11.    (New)  The method of claim 6, wherein using particular deviation compensation data to calculate the new time-weighted deviation compensation data based on whether the new deviation compensation data is within a tolerance of an old time-weighted deviation compensation data comprises:

determining if a predetermined number of new deviation compensation data are within the tolerance of old deviation compensation data; and

excluding old deviation compensation data from a calculation of a new offset to be applied if the predetermined number of new deviation compensation data are not within the tolerance of old deviation compensation data.

12.    (New)  The method of claim 11, wherein determining if a predetermined number of new deviation compensation data are within the tolerance of old deviation compensation data comprises determining if a predetermined number of consecutive new deviation compensation data are within the tolerance of old deviation compensation data.

13.    (New)  The method of claim 12, wherein the predetermined number is two.

14. (New) A method for calibrating an electronic compass, comprising:

calculating a first averaged data point using a first predetermined number of data points;

calculating a second averaged data point using a second predetermined number of data points;

calculating a third averaged data point;

calculating a fourth averaged data point; and

calculating deviation compensation data based on a combination of the first averaged data point, the second averaged data point, the third averaged data point, and the fourth averaged data point.

15. (New) The method of claim 14, further comprising displaying a heading based on data that has been received from the electronic compass and that has been compensated based on the deviation compensation data.

16. (New) The method of claim 14, wherein calculating the first averaged data point comprises calculating the first averaged data point based on a predetermined number of consecutive points that meet a predetermined criteria.

17. (New) The method of claim 16, wherein the predetermined criteria includes at least one of;

a. the data points were collected while a vehicle was traveling a predetermined speed, the predetermined speed being a value at least about ten miles per hour;

b. the data points were not collected consecutively with a large number of points not meeting a second predetermined criteria.

18. (New) The method of claim 14, further comprising using the combination of the averaged data points to calculate an x-axis offset and a y-axis offset.

19. (New) The method of claim 14, wherein the first predetermined number of data points and the second predetermined number of data points are a same number.

20.    (New)  The method of claim 14, wherein calculating deviation compensation based on a combination of the first averaged data point, the second averaged data point, the third averaged data point, and the fourth averaged data point comprises;

      determining that the first averaged data point, the second averaged data point, and the third averaged data point do not meet a predetermined criteria;

      determining a combination of any three of the first, second, third, and fourth averaged data points that meet the predetermined criteria; and

      calculating the offset using the combination of three averaged data points that meet the predetermined criteria.

21.    (New)  The method of claim 20, wherein the predetermined criteria includes at least one of;

      a.    the data points are a minimum distance apart from each other;

      b.    three of the data points do not form a substantially obtuse triangle; and

      c.    three of the data points do not form a triangle that is too acute.

22.    (New)  A method for calculating deviation compensation data for an electronic compass circuit, comprising:

determining whether data points received from an electronic magnetic field detector meets a first predetermined criteria; and

calculating deviation compensation data based on the data points received from an electronic magnetic field detector if the data points meet the first predetermined criteria;

wherein the first predetermined criteria comprises a vehicle speed criteria which includes that the data points be collected while a vehicle is traveling at least a predetermined speed.

23.    (New)  The method of claim 22, wherein the predetermined speed is a value at least about ten miles per hour.

24.    (New)  The method of claim 23, wherein the vehicle speed criteria is not used for initial calibration, but is used for continuous calibration.

25.    (New)  The method of claim 22, wherein the vehicle speed criteria is not used for initial calibration, but is used for continuous calibration.

26.    (New)  The method of claim 25, wherein the data points used for calculating deviation compensation data in an initial calibration mode must be obtained while a vehicle is moving.

27.    (New)  The method of claim 25, further comprising:

determining if a vehicle is moving; and

calculating the deviation compensation data based only on data points obtained when the vehicle is moving.

28.    (New)  A method for calculating deviation compensation data for an electronic compass circuit, comprising:

determining if a vehicle is moving a predetermined speed; and

obtaining data to be used to calculate deviation compensation data based on the determination of vehicle speed.

29.    (New)  The method of claim 28, wherein the predetermined speed is at least about ten miles per hour.

30.    (New)  The method of claim 29, further comprising calculating deviation compensation data for the electronic compass using only data points obtained while the vehicle was moving at least the predetermined speed.